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PATENTS ACT 1990

PATENT REQUEST: STANDARD PATENT

We, ALMONTE DIAMOND PTY LTD (A.C.N. 062 566 652) being the persons identified below as the Applicant, request the grant of a patent to the person identified below as the Nominated Person, for an invention described in the accompanying standard Complete Specification.

Full application details follow.

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ASSOCIATED PROVISIONAL APPLICATION DETAILS

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ALMONTE DIAMOND PTY LTD
By their Patent Attorneys
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CUTTING APPARATUS

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(57)

The present invention relates to a cutting apparatus (10). The cutting apparatus (10) includes a sawing means (48) , a pushing means (36, 38, 40, 42, 44 and 46) and at least one guide member (64). The pushing means (36, 38, 40, 42, 44 and 46) pushes a material to be cut along the guide member (64) so as to be cut by the sawing means (48). The pushing means preferably includes a conveyor arrangement (36) with attached pusher finger members (46) . The conveyor arrangement (36) may extend the entire length of the cutting apparatus (10'). The guide member (64) and a plate (26) preferably form a channel in which the material to be cut is placed. The material to be cut is preferably a core sample. The cutting apparatus (10) also preferably includes a water tank (46) which cools the sawing means (48) and wets the core sample. The sawing means (48) is preferably a circular diamond saw blade.

CLAIM

1. A cutting apparatus including a sawing means, a pushing means and at least one guide member such that the pushing means is arranged to push a material to be cut along the guide member so as to be cut by the sawing means.

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COMPLETE SPECIFICATION

FOR A STANDARD PATENT
(Original)

APPLICATION NO:
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COMPLETE SPECIFICATION LODGED:
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RELATED ART:

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INVENTION TITLE: "CUTTING APPARATUS"

DETAILS OF ASSOCIATED PROVISIONAL APPLICATION NO'S:

PN0035 filed on December 14, 1994

The following Statement is a full description of this invention including the best method of performing it known to us:

TITLE

CUTTING APPARATUS

DESCRIPTION

The present invention relates to a cutting apparatus. In particular, the present invention relates to a cutting apparatus for cutting core samples

FIELD OF THE INVENTION

Presently, core samples are cut by hand using a brick cutter. This method of cutting has inherent dangers, since a person must push the core sample towards a cutting blade by hand. Further, premature wear on the cutting blade can result from a person exerting too much pressure on the core sample.

The present invention seeks to alleviate at least part of the above disadvantages of known cutters.

SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention there is provided a cutting apparatus including a sawing means, a pushing means and at least one guide member such that the pushing means is arranged to push a material to be cut along the guide member so as to be cut by the sawing means.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side plan view of a first embodiment of a cutting apparatus in accordance with an aspect of the present invention;

Figure 2 is an end plan view of the cutting apparatus as shown in Figure 1;

Figure 3 is a top plan view of the cutting apparatus as shown in Figure 1;

Figure 4 is a side plan view of a second embodiment of a cutting apparatus in accordance with an aspect of the present invention;

Figure 5 is an end plan view of the cutting apparatus as shown in Figure 4; and

Figure 6 is a top plan view of the cutting apparatus as shown in Figure 4.

DESCRIPTION OF THE INVENTION

In Figures 1 to 3 there is shown a cutting apparatus 10 including a frame 12, a first top plate 14 and a second top plate 16. The frame 12 has a first end 18 and a second end 20. The top plates 14 and 16 are positioned on the frame 12 so as to form a gap 22 therebetween. The top plates 14 and 16 extend downwardly into the gap 22 to form side walls 24. The side walls 24 terminate at a plate 26. The gap 22, the side walls 24 and the plate 26 extend between the first end 18 and the second end 20 of the frame 12.

The plate 26 has slots 28 formed therein along part of the length thereof, adjacent the first end 18. A further slot 30 is formed in the plate 26 adjacent the second end 20. The plate 26 is substantially horizontal for most of its length, extending downwardly in a section 32 adjacent the second end 20. The gap 22 has a widened section 34 adjacent the second end 20.

There is further provided a chain 36, a pair of sprocket wheels 38, a DC motor and gearbox 40, a chain 42 and a pair of sprocket wheels 44. The pair of sprocket wheels 38 are mounted on the frame 12 in a spaced apart manner beneath the plate 26. The chain 36 extends between the sprocket wheels 38. A plurality of pusher fingers 46 are provided at spaced intervals around the chain 36. The pusher fingers 46 project partially through the slots 28 in the plate 26.

The DC motor and gearbox 40 is mounted on the frame 12. The chain 42 extends between the pair of sprocket wheels 44, which sprocket wheels 44 are mounted on the DC motor and gearbox 40 and a shaft on which one of the sprocket wheels 38 is mounted. The DC motor and gearbox 40 drives the chain 36 via the chain 42.

There is further provided a circular saw blade 48, a shaft 50, a pair of sprocket wheels 52, a motor 54, a water tank 56 and a chain 58. The circular saw blade 48 and one of the sprocket wheels 52 are mounted on the shaft 50. One of the sprocket wheels 52 is mounted on the motor 54. The chain 58 extends between the sprocket wheels 52, such that the motor 54 is in driving communication with the circular saw blade 48.

The circular saw blade 48 is provided adjacent the second end 20 beneath the plate 26. The

circular saw blade 48 projects partially through the slot 30 in the plate 26. The water tank 56 is mounted beneath the circular saw blade 48 so that the circular saw blade projects partially into the water tank 56. A cover plate 60 is mounted on the top plates 14 and 16 and covers the circular saw blade 48 which projects through the plate 26.

A pair of control boxes 62 are mounted on the frame 12. The control boxes 62 provide operator control of the motor 54 and the DC motor and gearbox 40. Through use of the control boxes 62, the motor 54 can be activated and the DC motor and gearbox 40 can be activated, and the speed thereof adjusted.

A pair of core guides 64 are provided and extend into the gap 22. The core guides 64 extend along the gap 22 at least as far as the slots 28, preferably further. A cross member 66 extends between the core guides 64 along part of their length. The cross member 66 is slotted at one end thereof, which end is mounted so that the circular saw blade 48 is positioned within the slot. The core guides 64 and the plate 26 form a channel.

The chain 36, the pair of sprocket wheels 38, the DC motor and gearbox 40, the chain 42, the pair of sprocket wheels 44 and the pusher fingers 46 include a pusher means.

In Figures 4 to 6 , there is shown a cutting apparatus 10' in accordance with a second embodiment of the present invention. The same reference numbers are used in Figures 4 to 6 of the second embodiment, as were used in Figures 1 to 3 of the first embodiment, to denote the same items.

The cutting apparatus 10' includes a frame 12, a first top plate 14 and a second top plate 16. The frame 12 also has a first end 18 and a second end 20. There is also a gap 22, side walls 24 and a plate 26. The plate 26 also has slots 28 formed therein along part of the length thereof, adjacent the second end 20.

A circular saw blade 48 and a pair of sprocket wheels 52 are mounted on a shaft 50 by way of bearings 50a and 50b. The shaft 50 may be adjusted by shaft adjustment means 53. There is further provided a pushing means arrangement in the form of a chain 36, a pair of sprocket wheels 38, a DC motor and gearbox 40 and a plurality of pusher fingers 46 which are provided at spaced intervals around the chain 36. The pusher fingers 46 project partially through the slots 28 in the plate 26.

In Figure 4 , the circular blade 48, one of the sprocket wheels 52 and shaft 50 are shown as mounted above the plate 26 to allow the slots 28 and the chain 36 to extend the full length of the cutting apparatus 10'. This embodiment allows the material to be cut to be pushed

along the entire length of the cutting apparatus 10'. In the first embodiment , the material to be cut has to be pushed by another sample to be ejected from the cutting apparatus 10. In Figures 4 to 6 there is also shown a blade speed indicator means 49 mounted on the shaft 50. A blade speed input means 51 then reads the speed of the shaft 50 by detecting the speed of rotation of the blade speed indicator means 49. This input means 51 is then read by a microprocessor (not shown) housed in a circuitry box 80. Thus the speed of the blade 48 may be calculated by the microprocessor 53. If the speed of the blade 48 is less than a preset value then the drive to the chain 36 is stopped until an optimum cutting speed for the blade 48 is achieved.

The cutting apparatus 10' also may have an additional top plate cover (not shown) that encloses the gap 22, side walls 24 and a plate 26. The top plate cover includes a hose attachment means for an ordinary water hose which is located towards the front end 18. A water supply is provided to moisten and wash the material to be cut. The dirty water is then drained to a water tank 56. The water tank 56 has a plug 57 by which the dirty water may be drained away. There is also shown a control box 62 which is located on an outer side of the top plate 14 at a point approximately midway between the first end 18 and the second end 20.

In use, in the first embodiment of the present invention, the water tank 56 is partially filled with water such that the circular saw blade 48 is partially emersed in water. The motor 54 is activated via one of the control boxes 62. The motor 54 powers the circular saw blade 48. Since the circular saw blade 48 is partially emersed in water, as the circular saw blade 48 rotates it is cooled by the water.

The DC motor and gearbox 40 is then activated via one of the control boxes 62. The DC motor and gearbox 40 will not activate unless the motor 54 is already running, to prevent damage to the circular saw blade 48. The DC motor and gearbox 40 powers the chain 42. As the chain 42 rotates, the pusher fingers 46 move toward the circular saw blade 48. Core samples which it is desired to cut may be placed or slid into the channel. The pusher fingers 46 push the core sample toward and through the circular saw blade 48. The sloped section 32 allows cut core sample to slide from the cutting apparatus 10 into a storage device (not shown). The cross member 66 prevents core samples from lifting during cutting.

The second embodiment of the present invention is operated in a similar manner to the first embodiment except that it may be enclosed by an additional top plate cover (not shown)

which includes a hose attachment means as discussed hereinabove. The second embodiment also has a storage device (not shown) provided at the second end 20 of the apparatus 10' for cut core samples.

It is envisaged that different core guides 64 could be fitted to the cutting apparatus 10 to allow the cutting apparatus 10 to cut different sized core samples. Alternatively, the core guide 64 may be slidably mounted to the cutting apparatus 10 to allow adjustment thereof. Further, the cross member 66 could be slidably mounted to the core guides 64 to allow a vertical adjustment thereof.

Modifications and variations such as would be apparent to a skilled addressee are deemed within the scope of the present invention.

The claims defining the invention are as follows:-

1. A cutting apparatus including a sawing means, a pushing means and at least one guide member such that the pushing means is arranged to push a material to be cut along the guide member so as to be cut by the sawing means.

2. A cutting apparatus according to claim 1 wherein the guide member forms a channel in which the material to be cut is placed and is subsequently pushed along the channel towards the sawing means by way of the pushing means.

3. A cutting apparatus according to claim 2, wherein the channel has a cross member mounted thereon which is arranged to prevent the material to be cut from lifting out of the channel.

4. A cutting apparatus according to any one of claims 1 to 3, wherein the sawing means is positioned at a point approximately above the guide member as the guide member extends substantially the entire length of the cutting apparatus to allow the pushing means to push the material to be cut the substantially entire length of the cutting apparatus.

5. A cutting apparatus according to any one of claims 1 to 4, wherein there is provided a blade speed input means which provides input to a microprocessor which then adjusts the speed of the pushing means to provide an optimum sawing speed for the sawing means.

6. A cutting apparatus according to any one of claims 1 to 5 wherein there is provided a water supply for cooling the sawing means and washing the material to be cut.

7. A cutting apparatus according to any one of claims 1 to 6, wherein the pushing means includes a conveyor arrangement with attached pusher finger members for the material to be cut.

8. A cutting apparatus according to any one of claims 1 to 7, wherein the sawing means is a substantially circular diamond blade.

9. A cutting apparatus substantially as hereinbefore described with reference to any one of the accompanying drawings.

DATED THIS 1ST DAY OF DECEMBER 1995

ALMONTE DIAMOND PTY LTD
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ABSTRACT

The present invention relates to a cutting apparatus (10). The cutting apparatus (10) includes a sawing means (48) , a pushing means (36, 38, 40, 42, 44 and 46) and at least one guide member (64). The pushing means (36, 38, 40, 42, 44 and 46) pushes a material to be cut along the guide member (64) so as to be cut by the sawing means (48). The pushing means preferably includes a conveyor arrangement (36) with attached pusher finger members (46) . The conveyor arrangement (36) may extend the entire length of the cutting apparatus (10'). The guide member (64) and a plate (26) preferably form a channel in which the material to be cut is placed. The material to be cut is preferably a core sample. The cutting apparatus (10) also preferably includes a water tank (46) which cools the sawing means (48) and wets the core sample. The sawing means (48) is preferably a circular diamond saw blade.

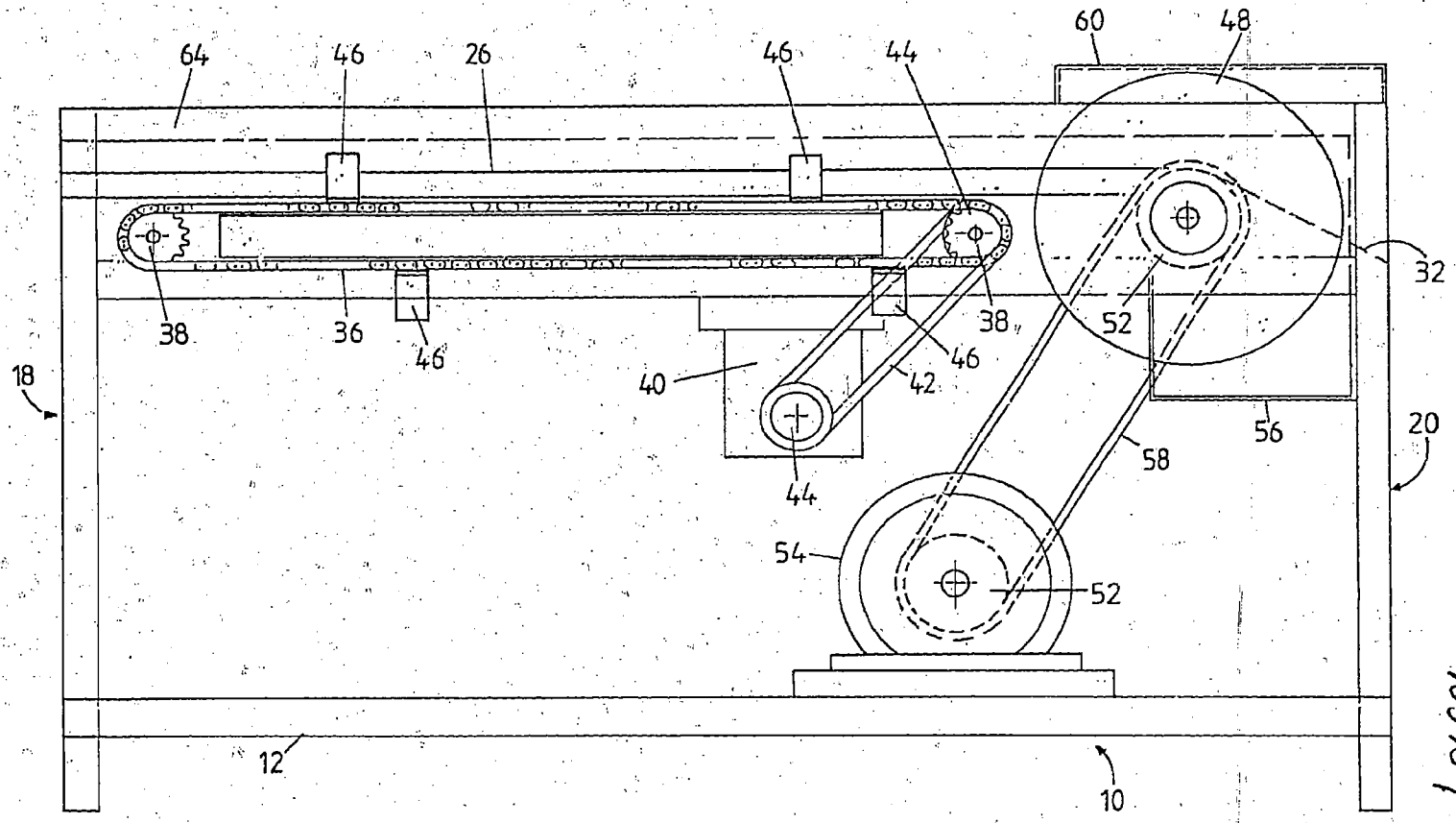

FIG.1

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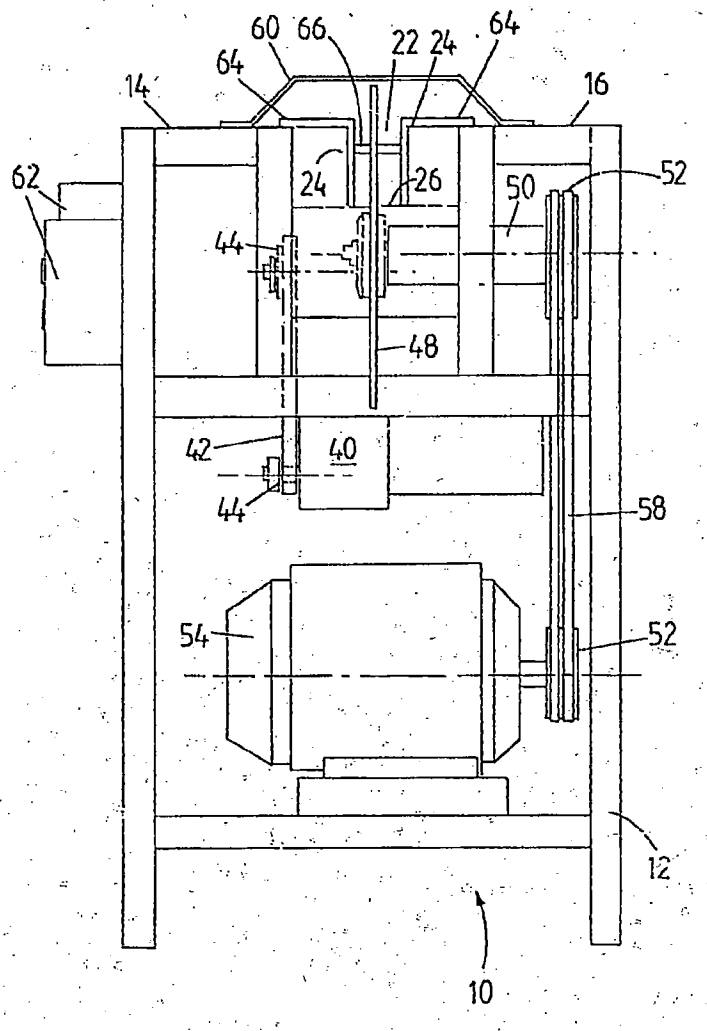

FIG. 2

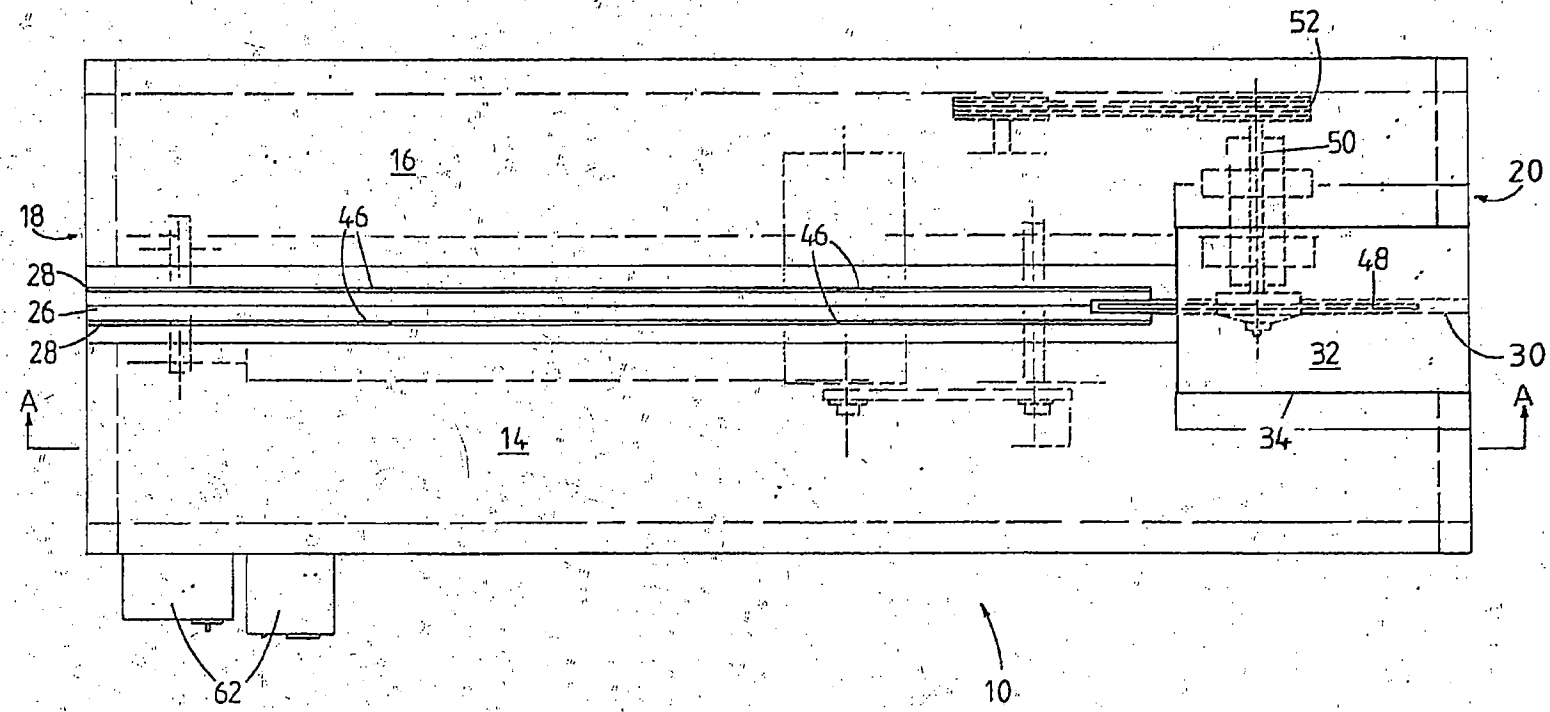

FIG.3

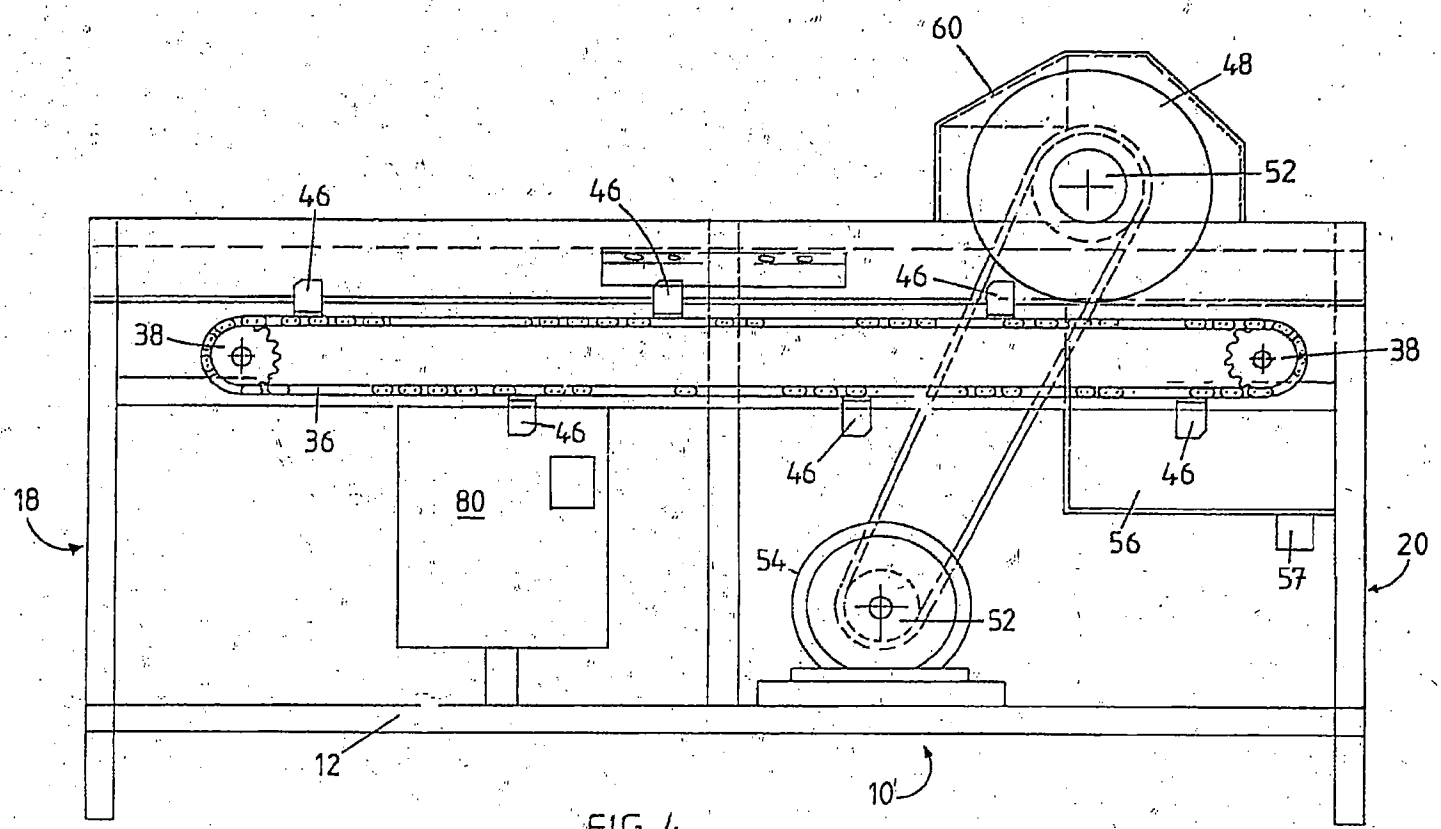

FIG. 4

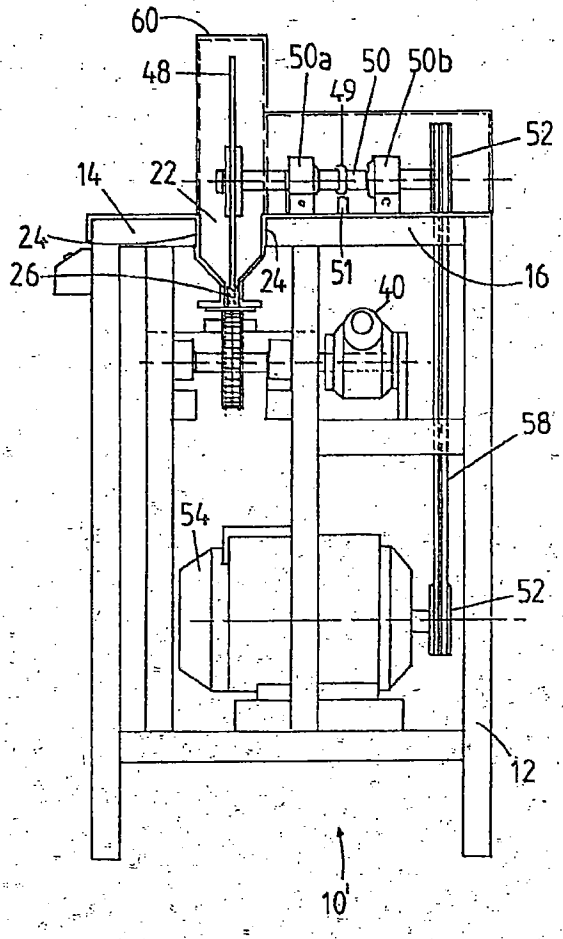

FIG.5

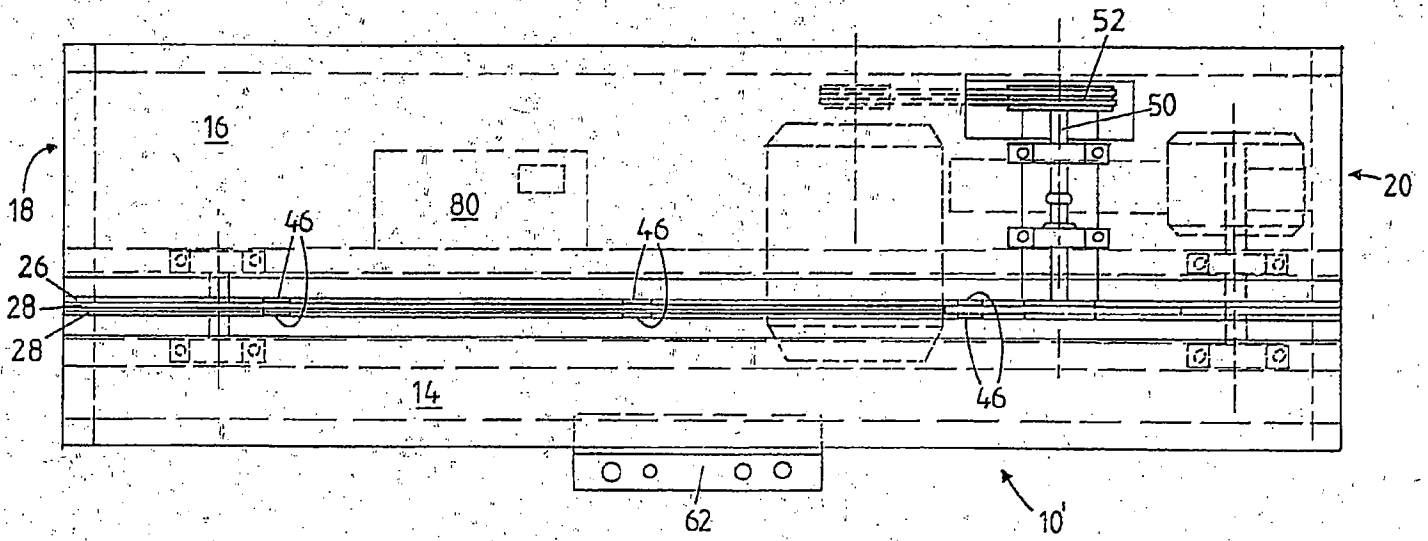

FIG.6